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### REMARKS

Claims 1-18 are pending in the application. Claim 1 has been amended by the present amendment. The amendment is fully supported by the specification as originally filed.

Applicants' claimed invention is directed to a semiconductor package with a heat sink, including: a substrate, at least one chip disposed on the substrate, and the heat sink attached to the chip and mounted on the top surface of the substrate. The heat sink includes a flat portion attached to the chip, a support portion, and a bonding portion. As recited in claim 1, at least one slot is formed through at least one corner of the bonding portion to expose the top surface of the substrate. An adhesive material is filled in the slot, such that the adhesive material overflows out of the slot.

For example, as shown in FIGS. 1 and 2, a slot 54 is formed through at least one corner of the bonding portion 53, such that a portion of the top surface 11 of the substrate 10 is exposed (see specification at page 8, last paragraph). Adhesive material 70 is filled in the slot 54, and overflows out of the slot 54 (see page 9, lines 3-4).

Applicants' claimed invention can provide significant advantages. Because the adhesive material is over filled in the slot, it provides an anchoring effect to firmly secure the heat sink in position on the substrate (see page 9, last paragraph). Further, the slot formed at the corner of the heat sink can alleviate thermal stresses accumulated at the corner of the heat sink, and thereby prevent delamination between the heat sink and the substrate (see page 9, last paragraph to page 10, first paragraph).

Claims 1-3, 5-12, 17, and 18 were rejected under 35 USC 102(b) as being anticipated by U.S. Patent 5,956,576 to Toy et al. (hereinafter "Toy"). Claims 4 and 13-16 were rejected under 35 USC 103(a) as being unpatentable over Toy. These rejections are respectfully traversed.

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Toy does not teach or suggest a semiconductor package including a heat sink mounted on the top surface of a substrate, the heat sink having a support portion and a bonding portion extending laterally from the support portion, and at least one slot formed through at least one corner of a bonding portion of a heat sink to expose the top surface of a substrate.

Toy discloses an apparatus and method for encapsulating ceramic chip carriers, including providing a fluid-tight, non-hermetic seal to the ceramic chip carrier utilizing dual surfaces (top surface and side-walls) (see column 1, lines 6-15 of Toy). As shown in FIGS. 1-3 of Toy, a sealant 23 is placed between a corner area 19 of a substrate 10 and the corner area 29/ledge 22 of the cap 20 to provide a dual surface seal, thereby allowing the substrate 10 to be secured to the cap 20 (see column 4, lines 21-25).

However, Toy does not teach or suggest the Applicants' claimed semiconductor package including a heat sink having a bonding portion that extends laterally from a support portion, and at least one slot formed through at least one corner of the bonding portion. In Toy, heat sink 36 is attached to the cap 20, but the cap 20 does not include a bonding portion **extending laterally** from a support portion. Also, the "slot" alleged in Toy is actually disposed between the corner area 19 of the substrate 10 and the corner area 29/ledge 22 of the cap 20, but is not formed **through** any bonding portion of a heat sink.

In contrast, according to the Applicants' claimed invention, at least one slot is formed through a bonding portion of a heat sink for exposing the top surface of the substrate, which can allow adhesive applied between the heat sink and the substrate to over fill, thereby providing an anchoring effect to firmly mount the heat sink on the substrate. Also, the slot allows increased contact between the adhesive material filled in the slot and the bonding portion of the heat sink, thereby enhancing bonding strength. Moreover, the slots situated at corners of the bonding portion can alleviate and release thermal stresses that are generated between the bonding portion and the substrate, and thereby prevent delamination between the heat sink and the substrate (see page 9, last paragraph to page 10, first paragraph of specification).

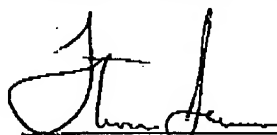
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Toy does not teach or suggest mounting the heat sink on the top surface of the substrate in which a bonding portion of the heat sink extends laterally from a support portion. Also, in Toy, the "slot" in Toy is not formed through any bonding portion of the heat sink, and does not expose the top surface of the substrate. Therefore, Toy is not capable of providing an anchoring effect as provided in the Applicants' invention, or achieve enhanced bonding strength.

For at least the reasons discussed above, the Toy reference does not anticipate or otherwise render obvious the Applicants' claimed invention.

It is believed the application is in condition for immediate allowance, which action is earnestly solicited.

Respectfully submitted,



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